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**Image watermarking-a spread spectrum application**

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Abstract:

This paper discusses the feasibility of coding a robust, undetectable, digital watermark into a standard 512*512 intensity image with an 24 bit RGB format. The watermark is capable of carrying such information as authentication or authorisation codes, essential for image interpretation. This capability is envisaged to find applications in tagging, copyright enforcement, counterfeit protection, and controlled access. The method chosen is based on linear addition of the watermark to the image data. The patterns adopted to carry the watermark are adaptations of m-sequences in c dimensions. The recovery process is based on correlation, just as in standard spectrum receivers. The technique is quite successful for one dimensional encoding of binary patterns, as shown for a variety of gray scale test images. A discussion of extensions of the method to two dimensions, RGB format and non-binary alphabets is presented. A critical review of other watermarking techniques is included.

Index Terms:

authorisation binary sequences copyright correlation methods image coding image analysis message authentication RGB format authentication authorisation codes patterns controlled access copyright enforcement correlation counterfeit protection test images image data image interpretation image tagging image watermarking sequences nonbinary alphabets one dimensional encoding recovery process spread spectrum receivers two dimensional encoding watermarking techniques